

## TIME SLOT TUNABLE ALL-OPTICAL PACKET DATA ROUTING SWITCH

### ABSTRACT OF THE DISCLOSURE

A fully "time tunable" all-optical switch routes/switches digital bits (packets) in an all-optical format for transmission, or for further processing, in an all-optical communication network. The all-optical switch is implemented in either a semiconductor hybrid or in a completely monolithic form. Variable time delay elements adjust the time delay of a clocking signal input and a data packet input. The clocking signal determines the state of two nonlinear optical elements, such as semiconductor optical amplifiers, incorporated in the upper and lower arms of a Mach-Zehnder configuration. An optical coupler is connected to the output of the all-optical switch. The output of data from selected ports of the optical coupler is controlled using the variable time delay elements.